REMARKS

Applicants thank the Examiner for the thorough consideration given the present application. Claims 1-3, and 6-12 are pending in the present application. Claims 4 and 5 are cancelled without prejudice or disclaimer of the subject matter contained therein. Claims 1 and 6 are independent claims.

Claim Objections

Claim 12 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. Claim 12 has been revised to avoid the reference considered objectionable to the examiner.

Rejections Under 35 U.S.C. 112

Claims 1, 4, 7 and 11 stand rejected under 35 U.S.C. § 112, second paragraph, as being allegedly indefinite. Claims 1, 7, and 11 have been amended to replace the phrase, "various kinds of information including", with ---at least--- to avoid the phrase considered objectionable by the examiner without narrowing claim scope. Claim 4 has been canceled. Accordingly, Applicants respectfully submit that the outstanding rejection is now clearly improper and should be withdrawn. Thus, reconsideration and withdrawal of this rejection is respectfully requested.

The present application is generally directed to an ID card generation and use system employing facial authentication. Facial authentication is performed utilizing biometric recognition techniques for the facial identification. According to the background of the present

application, one prior art system utilized a Gabor filter having varying resolution and orientation convolved around feature points such as eyes, nose, etc. For the convenience of the examiner, a **Gabor filter** is a linear filter whose impulse response is defined by a harmonic function multiplied by a Gaussian function. Because of the multiplication-convolution property (Convolution theorem), the Fourier transform of a Gabor filter's impulse response is the convolution of the Fourier transform of the harmonic function and the Fourier transform of the Gaussian function. See Wikipedia, for example.

In contrast to this filtering technique, according to the teachings of the present application, the present application utilized a form of distributed processing known as boosting, typically with a neural network to perform facial authentication. See the specification at page 12, lines 19-21. **Boosting** is a machine learning meta-algorithm for performing supervised learning. Boosting is based on the use of a larger set of **weak learners** to improve learning performance. A weak learner is defined to be a classifier which is only slightly correlated with the true classification. In contrast, a strong learner is a classifier that is arbitrarily well-correlated with the true classification. Again see Wikipedia, for example, for further information on boosting. By using boosting techniques, the present invention strengthens authentication performance by ensuring that even only slightly correlated aspects of facial appearance contribute to the authentication process.

Rejection Under 35 U.S.C. 103(a)

Claims 1, 4, 6 and 7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over ***Lu et al.*** (U.S. Patent No. 5,432,864) in view of ***Bennett*** (U.S. Patent No. 5,642,160).

Independent claims 1 and 6 have been amended to emphasize the feature of utilizing a boosting technique in face detection in both an ID card generation apparatus (claim 1) and a face authentication terminal (claim 6). By utilizing boosting technique in such apparatus or terminal, higher speed face detection is obtained as compared to the prior art. Since boosting was not heretofore utilized in facial detection or authentication and since this form of processing produces substantial improvement in performance, it is respectfully submitted that clams 1 and 6 now distinguish over the prior art applied by the examiner. The ***Lu et al.*** and ***Bennett*** references, alone or in combination, fail to teach or suggest the use of a boosting technique to enhance face detection.

Claims 4 and 5 have been canceled without prejudice.

Claim 6 has been made independent by incorporating all the limitations of canceled claim 4 into the amended claim 6.

Claim 7 is dependent on independent claim 6. Thus, Applicants submit that claim 7 is allowable at least by virtue of its dependency on claim 6. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

Claims 2, 3, and 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of ***Lu et at.*** with ***Bennett*** as applied to claim 1 above, and further in view of ***Sakuramoto*** (JP 2002-152492).

Claims 2 and 3 are dependent on independent claim 1. Thus, Applicants submit that claims 2 and 3 are allowable at least by virtue of its dependency on claim 1. The ***Sakuramoto*** references fails to teach the claimed boosting technique of claim 1 and thus cannot correct the deficiencies of Lu et al. and Bennett discussed above with respect to independent claim 1. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of ***Lu et at.*** with ***Bennett*** as applied to claim 6 above, and further in view of ***Simon*** (US 2003/0086591 A1).

Claim 8 is dependent on independent claim 6.The ***Simon*** references fails to teach the claimed boosting technique of claim 6 and thus cannot correct the deficiencies of Lu et al. and Bennett discussed about with respect to independent claim 6. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

Claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of ***Lu et at.*** with ***Bennett*** and ***Simon*** as applied to claim 6 above, and further in view of ***Sakuramoto***. Since none of these references discuss the claimed boosting technique, this claim is patentable for the reasons already discussed.

Claims 10 and 11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over ***Lu et at.*** in view of ***Simon***, and further in view of ***Wood***.

Claims 10 and 11 are dependent on independent claim 6. The ***Wood*** references fails to teach the claimed boosting technique of claim 6 and thus cannot correct the deficiencies of Lu et al. or Simon as discussed above. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

Conclusion

For all of the above identified reasons, the claims of the present application distinguish over the rejections applied by the examiner and are thus believed to be in condition for allowance. Thus, the Examiner is respectfully requested to reconsider the outstanding rejections and issue a Notice of Allowance in the present application.

However, should the Examiner believe that any outstanding matters remain in the present application, the Examiner is requested to contact Applicants' representative, Michael K. Mutter (Reg. No. 29,680) at the telephone number of the undersigned in order to discuss the application and expedite prosecution.

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Respectfully submitted,

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